REMARKS / ARGUMENTS

Initially, it is noted that this Amendment is in the newly required format for responses to office actions, such that each section of begins on a separate page.

Claim Amendments

By the foregoing amendments, Claims 1, 6, 11 and 16 have been amended to highlight and clarify the novel features of the present invention. More particularly, independent Claims 1 and 6 have each been amended to recite that the second population of polymeric additive particles has a mean particle diameter of at least 300 nm. Additionally, independent Claims 11 and 16 have each been amended to recite that the polymer component of the polymeric compositions is at least one polymeric material selected from the group consisting of aromatic polyesters, polycarbonate, styrene-acrylonitrile copolymers, styrenic resins, methyl methacrylate copolymers, polyolefins, polyvinyl halides, acrylonitrile-butadiene-styrene ("ABS") resins, polyamides, epoxy resins, polyacetals, epoxy resins, polyurethanes, thermoset resins, polyketones, polyetheretherketones, and blends, grafts, and copolymers thereof.

It is respectfully submitted that the foregoing amendments are supported by the present specification and do not introduce any new matter into the present application. For instance, with respect to Claims 1 and 6, page 13, line 30 to page 14, line 2 of the as-filed specification provides suggested and preferred ranges of the mean particle diameter for the larger-sized population of particles, which includes the range of about 300 nm to about 600nm. With respect to Claims 11 and 16, the as-filed specification, at page 54, line 28, to page 55, line 4, provides a listing of the suitable polymer components for use in the polymeric compositions of the present invention.

In the foregoing circumstances, it is hereby respectfully requested that amended independent Claims 1, 6, 11, and 16 be entered into the present application for examination on the merits.

Claim Rejections Under 35 U.S.C. §§ 102(a), 102(e) and 103(a)

On page 2-3 of the Office Action, the Examiner has rejected Claims 1-3, 5-8 and 11-20, under U.S.C. §§ 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a), as being obvious over, Hayes et al. (US 5,726,259). On page 3 of the Office Action, Claims 1-12 and 15 have also been rejected, under U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Troy et al. (US 5,599,854). Applicants respectfully traverse these rejections for the reasons which follow.

The present invention relates generally to a multiple polymeric additive system comprising a liquid component and a solids component (i.e., Claims 1-5). More particularly, as recited in amended independent Claim 1, the aforesaid solids component comprises polymeric additive particles which comprise a first population of polymer particles and a second population of polymer particles wherein the compositions of the first and second populations of polymer particles are different and the second population of polymeric additive particles has a mean particle diameter of at least about 300 nm.

Additionally, the present invention relates generally to a process for making the aforesaid multiple polymeric additive system (i.e., Claims 6-10). More particularly, as recited in amended independent Claim 6, the process of the present invention comprises at least the steps of providing an aqueous emulsion polymerization reaction mixture comprising a first population of polymer particles and a second population of polymer particles, and polymerizing a first group of one or more ethylenically unsaturated monomers in the aqueous emulsion polymerization reaction mixture. Moreover, as recited in amended independent Claim 6, after at least a portion of the first group of one or more ethylenically unsaturated monomers is polymerized, the chemical compositions of the first and second populations of polymer particles are different and the second population of polymeric additive particles has a mean particle diameter of at least about 300 nm.

The present invention also relates generally to a polymeric composition comprising a polymeric component and a polymeric additive component (i.e., Claims

11-15). As recited in amended independent Claim 11, the polymeric composition is prepared by a process which comprises at least the step of forming a blend comprising the polymeric component and at least one multiple polymeric additive system. As further recited in amended independent Claim 11, the polymer component comprises at least one polymeric material selected from the group consisting of aromatic polyesters, polycarbonate, styrene-acrylonitrile copolymers, styrenic resins, methyl methacrylate copolymers, polyolefins, polyvinyl halides, acrylonitrile-butadiene-styrene ("ABS") resins, polyamides, epoxy resins, polyacetals, epoxy resins, polyurethanes, thermoset resins, polyketones, polyetheretherketones, and blends, grafts, and copolymers thereof. The multiple polymeric additive system comprises: a) a liquid component, and b) a solid component, the solid component comprising polymeric additive particles, which comprise (i) a first population of polymer particles, and (ii) a second population of polymer particles, wherein the compositions of the first and second populations of polymer particles are different.

Lastly, the present invention also relates generally to a process for making a polymeric composition comprising a polymeric component and a polymeric additive component (i.e., Claims 16-20). As recited in amended independent Claim 16, the process comprises at least the steps of: contacting the polymeric component with a multiple polymeric additive system to form a blend; and removing at least a portion of the liquid component from the blend. Moreover, as also recited in amended independent Claim 16, the polymeric component comprises at least one polymeric material selected from the group consisting of aromatic polyesters, polycarbonate, styrene-acrylonitrile copolymers, styrenic resins, methyl methacrylate copolymers, polyolefins, polyvinyl halides, acrylonitrile-butadiene-styrene ("ABS") resins, polyamides, epoxy resins, polyacetals, epoxy resins, polyurethanes, thermoset resins, polyketones, polyetheretherketones, and blends, grafts, and copolymers thereof. The multiple polymeric additive system comprises (a) a liquid component and (b) a solid component, wherein the solid component comprises polymeric additive particles which, in turn, comprise (i) a first population of polymer particles, and (ii) a second population of polymer particles. Moreover, as also recited in amended independent Claim 16, the

compositions of the first and second populations of polymeric additive particles are different.

It is respectfully submitted that neither of the references (i.e., Hayes et al. and Troy et al.) cited by the Examiner either anticipate or make obvious the present invention as recited in each of amended independent Claims 1, 6, 11 and 16.

More particularly, while Hayes et al. discloses a bimodal latex having small size particles and large size polymer particles, Hayes et al. fails to disclose or suggest that one of those populations of polymer particles has, or may have, a mean particle diameter of at least 300 nm, as in the present invention (Claims 1-10). In this regard, as explained further hereinbelow, it is respectfully noted that the Examiner has erred in the conversion calculation from angstroms (Å) to nanometers (nm) and, therefore, has erroneously concluded that the particles disclosed in Hayes et al. are larger than (and therefore include) both populations of polymer particles of the multiple polymeric additive system of the present invention.

The following measurement relationships are well-known to persons of ordinary skill in the art:

$$1 \text{ Å} = 1.0 \times 10^{-10} \text{ meters}$$

$$1 \text{ nm} = 1.0 \times 10^{-9} \text{ meters}$$

Thus, angstroms are smaller than nanometers by a factor of ten, and 1 nm = 10 Å.

Hayes et al. (Col. 6, lines 55-60) reports that the small size particles in its bimodal latex have a particle diameter of about 500 Å to 800 Å, and that the large size particles have a particle diameter of about 1500 Å to 2000 Å. In Example 1 of Hayes et al., the diameter of the small particles was measured at about 690 Å, and the diameter of the large particles was measured to be about 1615 Å.

Applying the above-stated conversion factors to the particle sizes reported in Hayes et al. results in the following calculations:

Range of small size particle diameter: 500 Å to 800 Å → 50 nm to 80 nm

$$500 \text{ Å} \times [(1 \text{ nm}) / (10 \text{ Å})] = 50.0 \text{ nm}$$

$$800 \text{ Å} \times [(1 \text{ nm}) / (10 \text{ Å})] = 80.0 \text{ nm}$$

Range of large size particle diameter: 1500 Å to 2000 Å → 150 nm to 200 nm

1500 Å x [(1 nm) / (10 Å)] = 150.0 nm

2000 Å x [(1 nm) / (10 Å)] = 200.0 nm

Example 1 particle sizes:

690 Å x [(1 nm) / (10 Å)] = 69.0 nm

1615 Å x [(1 nm) / (10 Å)] = 161.5 nm

It is also noted that Hayes et al. discloses that the "preferred" size range for the small size particles is a diameter of from 600 to 700 Å (i.e., 60.0 to 70.0 nm), and the "preferred" size range for the large size particles is a diameter of from 1500 to 1700 Å (i.e., 150.0 to 170.0 nm).

Based on the foregoing information, it can be easily seen that none of the particles of the bimodal latex disclosed in Hayes et al. are as large as the second population of particles of the multiple polymeric additive system of the present invention (which has a mean particle diameter of at least about 300 nm, as recited in each of amended independent Claims 1 and 6). In the foregoing circumstances, it is respectfully submitted that Hayes et al. does not anticipate the present invention, as recited in each of amended independent Claims 1 and 6, because Hayes et al. fails to disclose particles having particle diameters of at least about 300 nm.

It is further submitted that Hayes et al. does not render the present invention obvious because the disclosure of Hayes et al. teaches away from the present invention as recited in amended independent Claims 1 and 6. More particularly, at Col 6, lines 61-65, Hayes et al. discusses the importance and preference for minimizing the "oversized, non-useable polymer" in the bimodal latex in order to improve (i.e., minimize) residue levels of the final paper coating product. This implies that particles having diameters larger than 200 nm (2000 Å), such as the diameter (at least 300 nm) required for the second population of polymer particles of the present invention, would render the particles and the bimodal latex unsuitable for their intended purpose as

paper coatings as disclosed in Hayes et al. Thus, it is respectfully submitted that Hayes et al. teaches away and discourages persons of ordinary skill in the relevant art from increasing the size of the particles beyond those identified in the Hayes et al. disclosure. Hayes et al. provides no suggestion or motivation to increase the particle sizes of any of the particles in the bimodal latex disclosed therein to be at least 300 nm, as required for the second population of polymer particles of the present invention (recited in amended independent Claims 1 and 6). In the foregoing circumstances, it is respectfully submitted that Hayes et al. does not make obvious the present invention as recited in amended independent Claims 1 and 6.

Based on the foregoing explanation and argument, it is believed that amended independent Claim 1, as well as Claims 2, 3 and 5 which depend directly or indirectly therefrom, and amended independent Claim 6, as well as Claims 7 and 8 which depend directly or indirectly therefrom, are allowable over Hayes et al.

With respect to Claims 11-20 of the present application, it is respectfully submitted that Hayes et al. also fails to disclose or suggest the present invention as recited in each of amended independent Claims 11 and 16, i.e., which requires formation of a polymeric composition by blending at least one multiple polymeric additive system (comprising a first and a second population of polymer particles) with a polymeric component comprising at least one of the particular polymer materials which are listed in each of amended independent Claims 11 and 16. More particularly, it is noted that Hayes et al. fails to disclose that it would be suitable or desirable to combine or blend the bimodal latex disclosed therein with at least one of the polymer materials recited in each of amended independent Claims 11 and 16 (i.e., at least one polymeric material selected from the group consisting of aromatic polyesters, polycarbonate, styrene-acrylonitrile copolymers, styrenic resins, methyl methacrylate copolymers, polyolefins, polyvinyl halides, acrylonitrile-butadiene-styrene ("ABS") resins, polyamides, epoxy resins, polyacetals, epoxy resins, polyurethanes, thermoset resins, polyketones, polyetheretherketones, and blends, grafts, and copolymers thereof). In the foregoing circumstances, it is respectfully submitted that Hayes et al. does not anticipate the present invention as recited in each of amended independent Claims 11 and 16.

Moreover, since Hayes et al is concerned with an entirely different application of polymer particles (, i.e., as binders in paper coating formulations) from the field of the present invention (i.e., additives for polymer resin materials to improve the processing and end use characteristics of such polymer resin materials), it is respectfully submitted that the disclosure of Hayes et al. would not have suggested to persons of ordinary skill in the relevant art that modifications to the polymer particle binders, and methods of making and using same, that are disclosed in Hayes et al. would have resulted in the polymeric composition of the present invention, recited in amended independent Claim 11, or the process of the present invention for making same, as recited in amended independent Claim 16. Since it concerns a different field of application, nothing in Hayes et al. would have motivated persons of ordinary skill in the art to the produce and use the polymeric composition comprising a polymeric compound and a multiple polymeric additive system recited in Claim 11 of the present application, nor the process for making such a polymeric composition recited in Claim 16. In the foregoing circumstances, it is respectfully submitted that Hayes et al. does not make obvious the present invention as recited in each of amended independent Claims 11 and 16.

Based on the foregoing explanation and argument, it is believed that amended independent Claim 11, as well as Claims 12-15 which depend directly or indirectly therefrom, and amended independent Claim 16, as well as Claims 17-20 which depend directly or indirectly therefrom, are allowable over Hayes et al.

Turning now to Troy et al., this reference fails entirely to disclose or suggest the presence of two different populations of polymer particles as in the present invention, as recited in each of independent Claims 1, 6 and 11. Instead of the two populations of polymer particles of the present invention, wherein each population's particles exist separately from one another, Troy et al. discloses multi-stage (i.e., core/shell) impact modifier polymer particles wherein at least two phases exist together within each polymer particle (see, for example, Troy et al.: Abstract; Col. 2, line 4 and Claims 1 and 2). Core/shell technology is generally well-known and understood by persons having ordinary skill in the relevant art. One or both of the first and second populations of polymer particles of the present invention may comprise core/shell type particles (see,

for example, page 15, lines 24-30, of the present specification), as well as other types of particles shapes and morphologies, however, it is not required that the polymer particles of either of the first and second populations of particles of the present invention be core/shell type particles. Furthermore, there is nothing in Troy et al. to suggest to persons of ordinary skill in the relevant art how to prepare and use a multiple polymeric additive system which includes a liquid component and a solid component wherein the solid component comprises a first population of polymer particles and a second population of polymer particles, as in the present invention (see amended independent Claims 1, 6 and 11). In the foregoing circumstances, it is respectfully submitted that Troy et al. does not anticipate or make obvious the present invention as recited in each of amended independent Claims 1, 6 and 11.

Based on the foregoing explanation and argument, it is believed that: (1) amended independent Claim 1, as well as Claims 2-5 which depend directly or indirectly therefrom; (2) amended independent Claim 6, as well as Claims 7-10 which depend directly or indirectly therefrom; and (3) amended independent Claim 11, as well as Claims 12 and 15 which depend directly or indirectly therefrom, are all allowable over Hayes et al.

In view of the foregoing amendments and remarks, re-examination and allowance of Claims 1-20 are respectfully requested. All of Claims 1-20 are believed to be allowable.

If there remain any outstanding issues which the Examiner believes could be resolved by telephone, the Examiner is cordially invited to telephone the undersigned attorney to discuss same at the telephone number provided below.

CONCLUSION

A fee of **$110** is believed to be due in connection with the submission of this Amendment, since it is being submitted within one month after the originally set due date for response to the Office Action. This $110 fee is addressed by the accompanying Petition for Extension, which authorizes this $110 to be charged to **Deposit Account No. 18-1850**.

No additional fees are believed to be due in connection with the submission of this Amendment. If, however, any such fees, including petition and extension fees, are due, the Commissioner is hereby authorized to charge such fees, as well as to credit any overpayments, to **Deposit Account No. 18-1850**. In the meantime, please direct all future correspondence relating to the present application to the undersigned attorney.

Respectfully Submitted,

Date: **June 14, 2004**

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